



Methods to increase the isoflavonoid levels in plants and plants producing increased levels of isoflavonoids

Description of Technology: This invention pertains to methods of increasing isoflavonoid production in isoflavonoid-producing plants by transforming plants with at least one construct comprising nucleic acid fragments encoding at least a portion of a flavanone 3-hydroxylase, a C1 myb transcription factor, and an R-type myc transcription factor.

Patent Listing:

1. **US Patent No. 7,189,895**, Issued March 13, 2007, “Methods to increase the isoflavonoid levels in plants and plants producing increased levels of isoflavonoids”

<http://patft.uspto.gov/netacgi/nph-Parser?Sect2=PTO1&Sect2=HITOFF&p=1&u=%2Fnetacgi%2FPTO%2Fsearch-bool.html&r=1&f=G&l=50&d=PALL&RefSrch=yes&Query=PN%2F7189895>

Market Potential: Isoflavonoids represent a class of secondary metabolites produced in legumes by a branch of the phenylpropanoid pathway and include such compounds as isoflavones, isoflavanones, rotenoids, pterocarpanes, isoflavans, quinone derivatives, 3-aryl-4-hydroxycoumarins, 3-arylcoumarins, isoflav-3-enes, coumestans, alpha-methyldeoxybenzoins, 2-arylbenzofurans, isoflavanol, coumaronochromone and the like. Isoflavonoid-derived compounds are involved in symbiotic relationships between roots and rhizobial bacteria which eventually result in nodulation and nitrogen-fixation (Phillips, D. A. (1992) in Recent Advances in Phytochemistry. Vol. 26, pp 201 231, Stafford, H. A. and Ibrahim, R. K., Eds, Plenum Press, New York), and overall they have been shown to act as antibiotics, repellents, attractants, and signal compounds (Barz, W. and Welle, R. (1992) Phenolic Metabolism in Plants, pg 139 164, Ed by H. A. Stafford and R. K. Ibrahim, Plenum Press, New York).

The physiological benefits associated with isoflavonoids in both plants and humans make the manipulation of their contents in crop plants highly desirable. For example, increasing levels of isoflavonoids in soybean seeds increases the efficiency of extraction and lowers the cost of isoflavone-related products sold today for use in either reduction of serum cholesterol or in estrogen replacement therapy. Therefore there is a need to enhance the level of isoflavonoids in isoflavonoid-producing plants. Combining suppression of flavanone 3-hydroxylase (F3H) with activation of the phenylpropanoid pathway is one method to accomplish this goal.

Benefits:

- Enhances isoflavonoid levels in isoflavonoid-producing plants

Applications:

- Plant biology

Contact: Ken Anderson

Director, Entrepreneurial & Small Business Support, Delaware Economic Development Office (DEDO)

Carvel State Building, 820 French Street, Wilmington, DE, 19801

Phone: (302) 577-8496, Fax: (302) 577-8499, Email: Kenneth.R.Anderson@state.de.us